REMARKS

Claims 1-17 and 19-21 are currently pending. Claims 1, 5, 9, 10, 14-15, and 19 have been amended. Claim 18 has been cancelled and claim 21 has been added.

The Examiner objected to Fig. 2 for identifying the same feature using two reference numbers. In addition, the Examiner objected to Fig. 2 as being confusing and as having an improperly hatched portion.

Applicant has amended Fig. 2 and added a new Fig. 3 to overcome the Examiner's objections. Amended Fig. 2 shows the valve in a closed position and now illustrates only the second flow path 105. Fig. 3 illustrates the valve in an open position and illustrates only the first flow path 100. In addition, the un-hatched portion identified by the Examiner has been hatched. A redlined version of Fig. 2 has been included for the Examiner's reference.

Fig. 3 does not add new matter as the features illustrated in Fig. 3 were originally illustrated in Fig. 2 and/or were fully described in the specification. Specifically, the position of the solenoid plunger 145 and the movable diaphragm 55 are described in detail in the specification. *See Specification page 7, line 20 through page 8, line 16.*

The Examiner noted several informalities in the claims. Specifically, claims 1, 9, 18, and 19 included informalities. Applicant amended claims 1, 9, and 19 to correct the informalities. Claim 18 has been cancelled.

The Examiner rejected claims 1-6, 8-11, 13, and 14 under 35 U.S.C. §102(b) as being anticipated by Laverty, Jr. (U.S. Patent No. 4,802,246).

Amended claim 1 defines a toilet that includes a bowl sized to contain a liquid, and a valve movable from a normally-closed position in which a liquid does not flow to the bowl to an open position in which the liquid is delivered to the bowl. The toilet also includes a sensor that is operable to sense a liquid level within the bowl and output an electrical signal indicative of the liquid level, and an actuator that is movable between a flush position and an idle position. An electronic controller is coupled to the sensor to receive the electrical signal. The controller is operable to move the valve to the open position in response to movement of the actuator to the flush position and the receipt of the electrical signal having a value indicative that the liquid level within the bowl is below a predetermined level.

Laverty, Jr. does not teach or suggest, among other things, a sensor that outputs an electrical signal indicative of the liquid level. Rather, Laverty, Jr. discloses a flush valve arrangement that includes a flush valve actuator assembly and an overflow sensor 16. The overflow sensor 16 includes a float valve that detects the liquid level within a bowl and inhibits opening of the flush valve when the liquid level exceeds a predetermined level. The float valve does not output an electrical signal indicative of the liquid level.

In addition, Laverty, Jr. does not teach or suggest an electronic controller coupled to the sensor to receive the electrical signal and operable to move the valve in response to the electrical signal value being indicative of a liquid level below a predetermined level. Laverty, Jr. teaches an entirely mechanical system with the exception of an infrared sensor that automatically initiates a flush. However, the infrared sensor does not receive an electronic signal indicative of the liquid level from a sensor. As such, the infrared sensor is not a controller as that component is defined in the specification and the claim.

In light of the foregoing, Laverty, Jr. does not teach or suggest each and every limitation of claim 1. As such, claim 1 is allowable. In addition, claims 2-8, which depend from claim 1, are allowable for these and other reasons.

Amended claim 9 defines an electrically-controlled toilet that includes a bowl sized to contain a liquid. A solenoid-operated valve is movable between a normally-closed position in which a liquid does not flow to the bowl and an open position in which the liquid is delivered to the bowl. A liquid-level sensor is at least partially positioned within the bowl and is operable to sense a liquid level within the bowl. The liquid-level sensor is operable to output an electrical flood signal in response to a sensed liquid-level above a predetermined level. An actuator is movable between a flush position and an idle position. A controller is operable to move the valve to the open position in response to movement of the actuator to the flush position and the absence of the flood signal.

Laverty, Jr. does not teach or suggest an electrically-controlled toilet, much less one that includes a sensor that outputs an electrical flood signal in response to a sensed liquid-level above a predetermined level. Rather, Laverty, Jr. discloses a system that uses a float valve to sense the level of liquid within the bowl. The float valve does not output any electrical signals, much less one indicative of a water level within the bowl above a predetermined value.

In light of the foregoing, Laverty, Jr. does not teach or suggest each and every limitation of claim 9. As such, claim 9 is allowable. In addition, claims 10-11 and 13-14, which depend from claim 9, are allowable for these and other reasons.

The Examiner rejected claims 15-16 and 18-20 under 35 U.S.C. §102(b) as being anticipated by Barnum (U.S. Patent No. 4,538,307).

Amended claim 15 defines a method of operating a toilet. The method includes providing a bowl operable to contain a liquid, sensing a liquid level within the bowl, and generating an electrical signal indicative of the liquid level. The method also includes moving an actuator to a flush position and opening a valve to provide a flow of liquid to the bowl when the actuator is in the flush position and the generated electrical signal corresponds to a liquid level within the bowl that is below a predetermined value.

Barnum does not teach or suggest a method that includes, among other things, sensing a liquid level within a bowl and generating an electrical signal indicative of the liquid level. Rather, Barnum teaches a flood level sensor that includes an upstanding tube. An orifice is formed in the upstanding tube at a position that corresponds to a flood level. When the fluid level is below the flood level the orifice is able to relieve any partial vacuum. However, when the fluid level rises above the flood level, the fluid within the tube rises to partially seal the orifice and prevent relief of the partial vacuum. Thus, Barnum teaches a mechanical system that communicates a fluid pressure to actuate a valve lockout device. Barnum does not include any device that generates an electrical signal indicative of a fluid level.

In light of the foregoing, Barnum does not teach or suggest each and every limitation of claim 15. As such, claim 15 is allowable. In addition, claims 16 and 18-20, which depend from claim 15, are allowable for these and other reasons.

The Examiner rejected claims 7, 12, and 17 under 35 U.S.C. §103(a) as being unpatentable over Laverty, Jr. and Barnum.

Claim 7 depends from claim 1 and adds that the controller includes a timer operable to initiate movement of the valve to the closed position after the valve has been in the open position for a predetermined length of time. As discussed with regard to claim 1, Laverty, Jr. does not teach or suggest all of the limitations of claim 1, much less those of claim 7.

Barnum does not cure the deficiencies of Laverty, Jr.. As discussed with regard to claim 15, Barnum discloses a mechanical system that transmits a pressure signal that is indicative of a flood condition within a bowl. Barnum does not disclose the use of a sensor that sends an electrical signal indicative of the water level within the bowl.

In light of the foregoing, Laverty, Jr. and Barnum, alone or in combination, do not teach or suggest each and every limitation of claim 1, much less those of claim 7. As such, claim 7 is allowable.

Claim 12 depends from claim 9 and adds that the controller includes a timer operable to initiate movement of the valve to the closed position after the valve has been in the open position for a predetermined length of time. As discussed with regard to claim 9, Laverty, Jr. does not teach or suggest all of the limitations of claim 9, much less those of claim 12.

Barnum does not cure the deficiencies of Laverty, Jr.. As discussed with regard to claim 15 and claim 7, Barnum discloses a mechanical system and does not include the use of a liquid-level senor that outputs an electrical flood signal in response to a sensed liquid-level above a predetermined level.

In light of the foregoing, Laverty, Jr. and Barnum, alone or in combination, do not teach or suggest each and every limitation of claim 9, much less those of claim 12. As such, claim 12 is allowable.

Claim 17 depends from claim 15 and adds that opening the valve further comprises energizing a solenoid. As discussed with regard to claim 15, Barnum does not teach or suggest all of the limitations of claim 15, much less those of claim 17.

Laverty, Jr. does not cure the deficiencies of Barnum. As discussed with regard to claim 1, Laverty, Jr. teaches the use a float valve to inhibit flushing in response to a high water level. Laverty, Jr. does not teach or suggest the step of generating an electrical signal indicative of the liquid level.

In light of the foregoing, Barnum and Laverty, Jr., alone or in combination, do not teach or suggest each and every limitation of claim 15, much less those of claim 17. As such, claim 17 is allowable.

CONCLUSION

In light of the foregoing, Applicant respectfully submits that claims 1-17 and 19-21 are allowable.

The undersigned is available for telephone consultation during normal business hours.

Respectfully submitted,

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Amendments to the Drawings

The attached drawing sheets (two (2) total) include an amended drawing for Fig. 2 and a new Fig. 3. The sheets, which include Figs. 2 and 3, replace the original sheet that included Fig. 2.

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Annotated Marked-Up Drawing
(Figure 2)

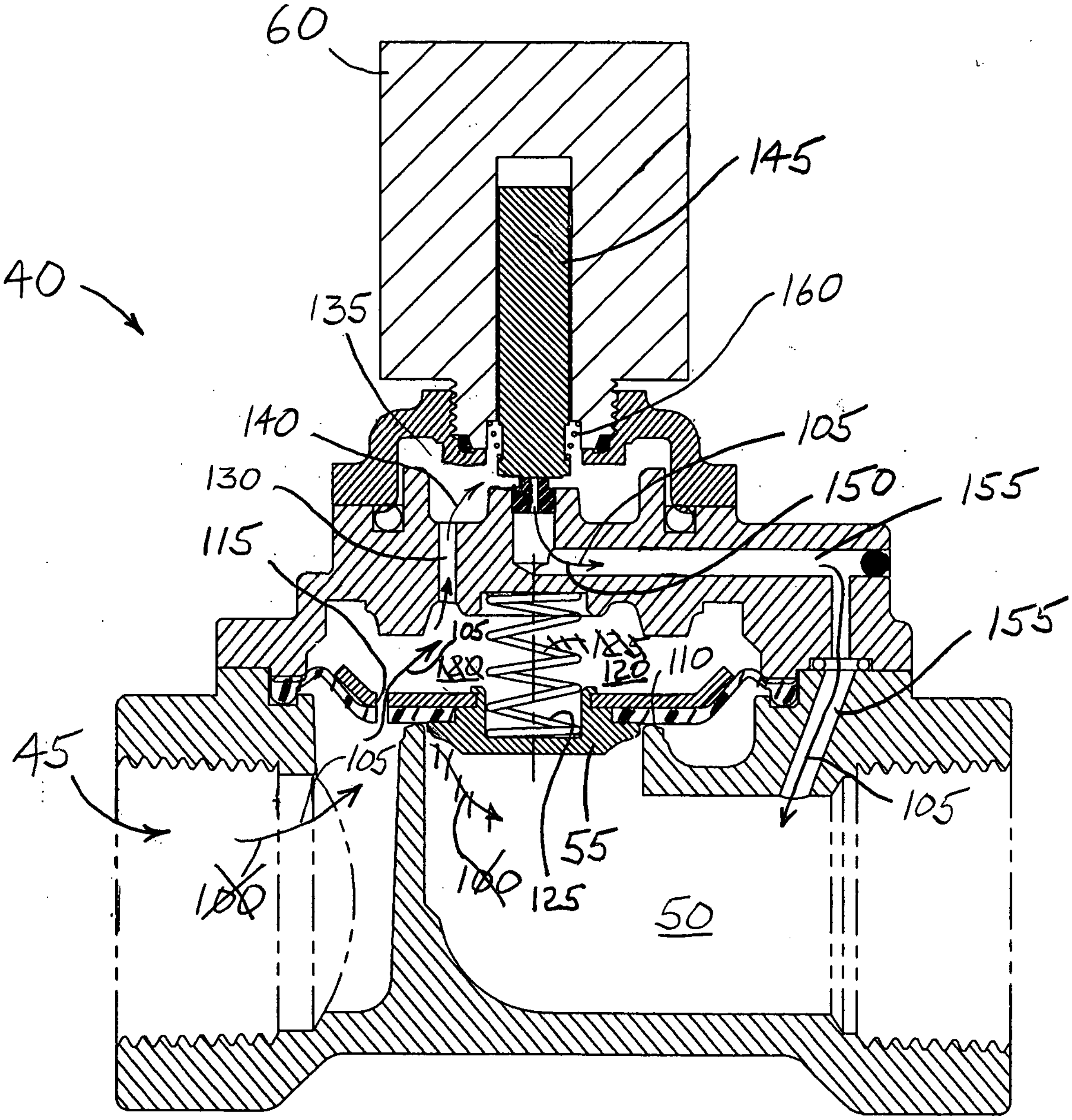

Fig. 2